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A SICKNESS SURVEY  
OF SOUTHERN FARGO.

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# A Sickness Survey of Boston, Mass.

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*Fourth Community Sickness Survey*

BY

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and

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Statistician

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METROPOLITAN LIFE INSURANCE COMPANY  
New York

1916

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RA807, M38

785°

# A Sickness Survey of Boston, Massachusetts.

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## *Fourth Community Sickness Survey.*

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The surveys\* already made by the writers have established the efficacy of the methods employed to determine the basic facts of sickness frequency in typical American communities. The principal findings of these surveys are in fundamental agreement; it is only in minor details that differences are found. These may be the result of variations in the race composition of the several populations, the geographical and climatic conditions, the principal industries followed, the seasons of the year, etc. The fourth survey was determined upon in order to develop more fully the practical possibilities arising out of such inquiries. The city of Boston was chosen for this study because of its large and representative population, its geographical location and its varied industrial activity. The appointment of a Special Commission on Social Insurance by the Governor of Massachusetts to report on health insurance among other matters, suggested the possibility that our findings for Boston might be especially useful to this body in its studies. Finally, the excellent medical facilities of Boston, including hospitals, dispensaries, a well-developed nursing association and other health and social agencies, confirmed our decision to make our study there. It was hoped that the facts developed by our inquiry might be put to practical use by placing the data obtained at the disposal of the Commission and of the several institutions.

The survey was made during the two weeks beginning July 17 and July 24, 1916. The method of enumeration, the inquiry form (see page 3 Rochester Survey) and the methods of statistical analysis of the data collected, were substantially the same in the fourth survey as in each of the previous ones. On the schedule, only one important addition need be noted,

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\*FRANKEL, LEE K., AND DUBLIN, LOUIS, I.

Community Sickness Survey, Rochester, N. Y., September, 1915.

Public Health Reports, February 25, 1916. Also as Public Health Reprint No. 326, U. S. Public Health Service, Washington, D. C., pp. 423-438.

Community Sickness Survey, North Carolina, April, 1916.

Public Health Reports, October 13, 1916, pp. 2820-2844. Also as a Public Health Reprint.

U. S. Public Health Service, Washington, D. C.

namely, Question 8 inquiring into the presence of a visiting nurse in the care of the sick. In tabulation a change in interpretation of the sick "unable to work" will be referred to later. A series of conferences were held with the Company's agents in Boston, the requirements of the schedule were fully explained and the interest of the men actively aroused to further the aims and purposes of the investigation. It is gratifying to record the fact that the schedules returned for the Boston survey show in every essential respect the conscientious response of the agents. Much is due also to the fine cooperation extended by the City Department of Health, through Dr. Francis X. Mahouey, Commissioner, and by the public press and medical journals of Boston, which gave valuable publicity in advance of the inquiry and prepared the community to receive the Company's agents cordially. These efforts were of distinct value in creating a favorable attitude toward the sickness census on the part of the uninsured public, the medical profession, as well as among the policy-holders of the Company.

The Company's agents canvassed every part of the city of Boston, including the outlying sections of Dorchester, Roxbury and South Boston; indeed, the entire area of the legal city was covered. More than 300 men were engaged in the survey. Together they canvassed 20,497 families and presented returns for a total of 97,259 persons. This number is about 13% of the total estimated population of the Greater City in 1916. The proportion of persons canvassed to total population is only slightly lower than in the Rochester survey. Internal evidence further confirms the reliability of the returns; thus, the number of persons per family, 4.7, agrees substantially with that found (4.5) for Boston families canvassed in May, 1915, in an unemployment survey made by the Metropolitan Life Insurance Company for the United States Bureau of Labor Statistics.

In all, 1,902 cases of sickness were recorded. This is equivalent to a rate of 19.6 persons sick in 1,000 persons canvassed, or under 2%. The sickness rate is fairly constant for each of the several districts in the city. The rate as a whole is distinctly lower than in the other surveys; the lowest previous rate being 23.1 per 1,000 for Rochester. It is of course possible that the very favorable condition shown for Boston is in part

the result of the season of the year when the survey was made, namely, the mid-summer, which is characterized by low mortality and by very low incidence of respiratory disorders, as we shall see later.

#### EXTENT OF DISABILITY.

Of the 1,902 cases of sickness discovered, 1,747, or 91.9%, were disabled for work, and 155, or 8.1%, were reported sick but able to work. The following Table 1 gives a more detailed presentation of the facts of disability among the entire groups of sick persons:

TABLE 1.

*Sickness in Boston, Mass., Two Weeks Beginning July 17, 1916,  
Classified by Extent of Disability and by Sex.*

EXTENT OF DISABILITY	ALL PERSONS		MALES		FEMALES	
	No.	Per Cent. of Total	No.	Per Cent. of Total	No.	Per Cent. of Total
ALL CLASSES . . .	1,902	100.0	935	100.0	967	100.0
Unable to work . .	1,747	91.9	850	90.9	897	92.8
In bed at home	326	17.1	123	13.2	203	21.0
In hospital . . .	337	17.7	201	21.5	136	14.1
Up and about . .	1,084	57.0	526	56.3	558	57.7
Dispensary . . .	153	8.0	79	8.4	74	7.7
Able to work . . .	155	8.1	85	9.1	70	7.2
Dispensary . . .	3	.2	2	.2	1	.1

The distribution of the sick persons according to the extent of disability is appreciably different in this survey from that found in the previous ones. Thus, in North Carolina the per cent. of "unable to work" to total sick was only 80.4; in Rochester, it was 82.8; in Boston, the corresponding figure was 91.9%. This difference has resulted largely from a change in the method of classifying the cases returned with ability to work "unspecified." In the previous investigations these cases were assumed uniformly to be "able to work." In the Boston survey it appeared altogether more reasonable to classify these unspecified returns on the basis of the internal evidence present in each case. As a result, a large proportion of the unspecified cases were found "unable to work." It is our belief that this method results in a tabulation much nearer the truth.

The proportion of cases of sickness receiving hospital treatment was larger in Boston than in any of the three areas

previously surveyed. It was 17.7% of total sick as against 2.4% in North Carolina and 10.7% in Rochester. This finding is consistent with the extensive hospital facilities of Boston in relation to population. There are about ten times more hospital beds per unit of population in Boston than in North Carolina, and this condition is reflected in the proportions of cases receiving hospital care among the sick persons registered in the two areas.

It was found feasible also to tabulate the number of ambulant cases receiving "dispensary" care among the sick. 8.2% of the sick were under treatment at dispensaries as out-patients. Nearly all the dispensary cases were unable to work, only three being recorded otherwise. Since dispensary authorities have found that a large proportion of their adult cases are at work, it would appear that our method of study is not well adapted to discover all the cases of sickness not resulting in incapacity to work.

No significant differences in the extent of disability were observed in the two sexes. A marked difference is to be noted, however, in the proportions of cases "in bed at home" and "in hospital" for the two sexes. The relations between these two sets of figures are apparently reversed, the males having a higher hospital proportion (21.5%) and the females a higher proportion of "in bed at home" cases (21.0%).

#### SICKNESS BY SEX AND BY AGE PERIOD.

Among the 97,259 persons enumerated in the survey, 1,902 cases of sickness were discovered, or at a rate of 19.6 per 1,000. Sickness involving disability for work was enumerated in 1,747 instances, or at a rate of 18.0 per thousand persons exposed. We shall now consider these facts of sickness with due regard for sex and age. Among the males, 19.9 persons were sick for each 1,000 exposed; the figure for females was 19.5 per thousand. Sickness involving disability for work occurred at a rate of 18.1 per thousand; the same rate of sickness was observed for females. The sickness rate for males in Boston was 1.5 cases per 1,000 less than that registered for Rochester, N. Y., and 5.2 points less per 1,000 than the rate for white males in North Carolina. The sickness rate for females in Boston (19.5 per thousand) was 5.3 points lower than in Rochester and 13.1 points lower than the rate for white females in North Carolina.

TABLE 2.

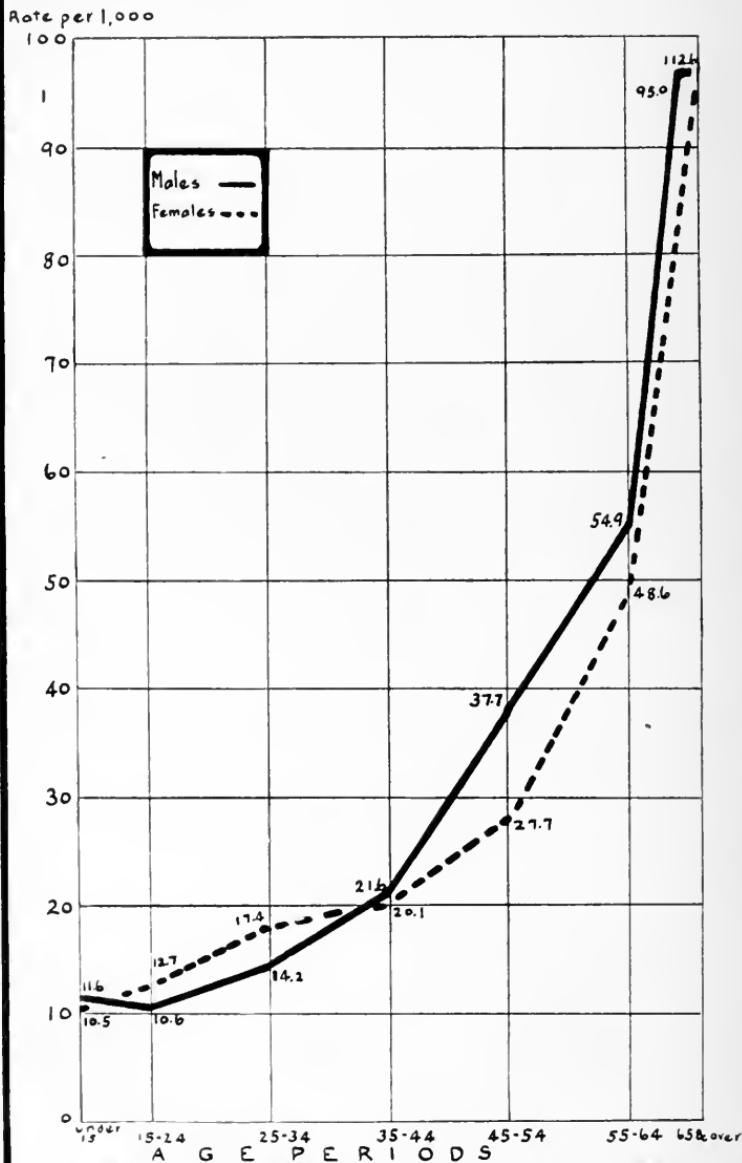
*Number of Cases and Rates per 1,000 Exposed by Age and Sex  
Total Sick, and Sick Unable to Work.*

SEX AND AGE PERIOD	Number of persons exposed	TOTAL SICK PERSONS		SICK PERSONS UNABLE TO WORK	
		Number	Rate Per 1,000 exposed	Number	Rate Per 1,000 exposed
<b>ALL PERSONS:</b>					
All ages.....	97,259	1,902	19.6	1,747	18.0
15 years and over..	64,028	1,538	24.0	1,389	21.7
Under 15.....	32,519	358	11.0	353	10.9
15-24.....	17,584	205	11.7	195	11.1
25-34.....	16,261	258	15.9	226	13.9
35-44.....	13,828	288	20.8	258	18.7
45-54.....	9,211	300	32.6	265	28.8
55-64.....	4,789	246	51.4	216	45.1
65 and over..	2,355	241	102.3	229	97.2
Unknown age.....	712	6	....	5	....
<b>MALES:</b>					
All ages.....	46,911	935	19.9	850	18.1
15 years and over..	30,792	748	24.3	665	21.6
Under 15.....	16,010	186	11.6	185	11.6
15-24.....	8,495	90	10.6	87	10.2
25-34.....	7,862	112	14.2	90	11.4
35-44.....	6,794	147	21.6	131	19.3
45-54.....	4,506	170	37.7	145	32.2
55-64.....	2,149	118	54.9	104	48.4
65 and over..	986	111	112.6	108	109.5
Unknown age.....	109	1	....	....	....
<b>FEMALES:</b>					
All ages.....	49,640	967	19.5	897	18.1
15 years and over..	33,153	790	23.8	724	21.8
Under 15.....	16,380	172	10.5	168	10.3
15-24.....	9,060	115	12.7	108	11.9
25-34.....	8,375	146	17.4	136	16.2
35-44.....	7,025	141	20.1	127	18.1
45-54.....	4,688	130	27.7	120	25.6
55-64.....	2,636	128	48.6	112	42.5
65 and over..	1,369	130	95.0	121	88.4
Unknown age.....	107	5	....	5	....
Sex not stated.....	708	....	....	....	....

The rates for sickness involving disability for work increased regularly with age for both sexes. The consistency of the rates with respect to age period may be considered as good evidence of the substantial character of the material repre-

GRAPH I

Cases of Sickness per 1000 Exposed Persons  
Boston, Mass., Week of July 17, 1916.



sented in this enumeration. The graph on page 6 illustrates the course of the sickness rates with respect to age period for the group of total sick persons among males and females respectively.

In the first two age periods the sickness rate of females exceeds that of males. The incidence of puerperal conditions in this period of life no doubt accounts for this excess of disabling sickness among females. This slight irregularity in the sickness rates for adult females is a characteristic of general morbidity statistics wherever observed. Beginning with the age period 35-44 and continuing uniformly thereafter, the rates for the females are appreciably lower than for the males.

#### SICKNESS IN BOSTON BY DISEASE.

The more important diseases and conditions enumerated in the survey are shown in Table 3. (See pages 8-9.)

Varied climatic, geographical and other environmental conditions affect the actual and relative frequency of the several diseases and conditions. In the North Carolina and Rochester surveys, rheumatism in its various forms constituted the single disease or condition of highest numerical importance. In the Boston survey, however, the title "External Causes" led the list with a rate of 198.4 per 100,000 exposed. Rheumatism was the cause next in importance, with a rate of 180.0 per 100,000, or 11.1% less than the North Carolina rate and 15.0% less than the Rochester finding.

Organic diseases of the heart were observed in 91 cases in the Boston survey and constituted 5.2% of the total sicknesses registered. The rate was 93.6 per 100,000. The Boston rate for organic diseases of the heart approaches the one discovered in Rochester, but is about one-third greater than the North Carolina rate. Tuberculosis of the lungs was found in 82 cases, or at the rate of 84.3 per 100,000. This is the lowest tuberculosis rate so far discovered in the several surveys. This disease constituted 4.7% of the total sickness recorded among the group of sick persons unable to work. Cerebral hemorrhage, apoplexy and paralysis were present in 81 cases at a rate of 83.3 per 100,000. The rate for this disease was lower in Boston than in the North Carolina or the Rochester inquiries. One-fifth of all the diseases and conditions recorded affected the nervous system and organs of special sense; which

TABLE 3.

Number of Sick Persons Unable to Work, Percentages of Each Disease or Condition; Rates per 100,000 Exposed,  
Classified by Sex.

DISEASE OR CONDITION	ALL PERSONS (97,259)				MALES *(46,911)				FEMALES *(49,640)				
	PERSONS SICK & UNABLE TO WORK		PERSONS SICK & UNABLE TO WORK		PERSONS SICK & UNABLE TO WORK		PERSONS SICK & UNABLE TO WORK		PERSONS SICK & UNABLE TO WORK		PERSONS SICK & UNABLE TO WORK		
	Number of cases	Per cent. of total	Number of cases	Cases per 100,000 exposed	Number of cases	Per cent. of total	Cases per 100,000 exposed	Number of cases	Per cent. of total	Cases per 100,000 exposed	Number of cases	Per cent. of total	
All diseases and conditions.....	1,747	100.0	1,796.2	850	100.0	1,811.9	897	100.0	1,807.0	461	26.4	474.0	
General diseases.....	2	1	2.1	2	2	4.3	21	2.3	42.3	44	2.5	45.2	
Typhoid fever.....	9	5	9.3	5	6	49.0	4	4	8.1	39	2.2	40.1	
Measles.....	8	5	8.2	6	7	32.0	2	2.7	48.3	1	1	1.0	
Scarlet fever.....	1	1	1.0	...	55	10.7	12.8	2	2.2	4.7	82	4.7	84.3
Whooping-cough.....	17	1.0	17.5	3	4	117.2	27	3.0	54.4	17	1.0	18.5	
Diphtheria and croup.....	18	1.0	18.5	4	5	8.5	14	1.6	28.2	11	0.6	11.3	
Influenza.....	1175	10.0	180.0	70	8.2	149.2	105	11.7	211.5	55	3.1	56.6	
Tuberculosis of the lungs.....	352	20.1	361.9	155	18.2	330.4	197	22.0	396.9	352	20.1	361.9	
Other forms of tuberculosis.....	81	4.6	83.3	31	3.6	66.1	50	5.6	100.7	34	1.9	35.0	
Cancer—all forms.....	15	1.9	15.4	6	2.6	46.9	12	1.3	24.2	21	1.2	21.6	
Other tumors.....	100	5.7	102.8	32	3.4	6.4	18	2.0	36.3	14	.8	14.4	
Rheumatism.....	50	2.9	51.4	35	3.6	68.2	68	7.6	137.0	19	1.1	19.5	
Other general diseases.....	16	.9	16.5	12	1.4	25.6	15	1.7	30.2	2	.1	2.1	
Diseases of the nervous system and of the organs of special sense.....	126	7.2	129.6	58	6.8	123.6	68	7.6	137.0	91	5.2	93.6	
Cerebral hemorrhage, apoplexy and paralysis.....	1	1	1	...	...	...	...	...	...	...	...	...	
Mental alienation (insanity).....	1	1	1	...	...	...	...	...	...	...	...	...	
Neuralgia and neuritis.....	1	1	1	...	...	...	...	...	...	...	...	...	
“Run-down”.....	1	1	1	...	...	...	...	...	...	...	...	...	
“Nervousness”.....	1	1	1	...	...	...	...	...	...	...	...	...	
Feeble-minded.....	1	1	1	...	...	...	...	...	...	...	...	...	
Other diseases of the nervous system.....	1	1	1	...	...	...	...	...	...	...	...	...	
Diseases of the eyes and ears.....	1	1	1	...	...	...	...	...	...	...	...	...	
Blind.....	1	1	1	...	...	...	...	...	...	...	...	...	
Deaf and dumb.....	2	1	2.1	...	...	...	2	.2	4.0	...	...	...	
Diseases of the circulatory system.....	1	1	1	...	...	...	...	...	...	...	...	...	
Organic diseases of the heart.....	1	1	1	...	...	...	...	...	...	...	...	...	

“Colds”	17	1.0	17.5	7	.8	14.9	10	1.1	20.1
Bronchitis	21	1.2	21.6	13	1.5	27.7	8	.9	16.1
Pneumonia—all forms	26	1.5	26.7	18	2.1	38.4	8	.9	16.1
Other diseases of the respiratory system	46	2.6	47.3	30	3.5	64.0	16	1.8	32.2
Diseases of the digestive system	178	10.2	183.0	81	9.5	172.7	97	10.8	195.4
Tonsillitis	9	.5	9.3	4	.5	8.5	5	.6	10.1
Other diseases of the pharynx	14	.8	14.4	7	.8	14.9	7	.8	14.1
Indigestion	12	.7	12.3	4	.5	8.5	8	.9	16.1
Other diseases of the stomach	60	3.4	61.7	27	3.2	57.6	33	3.7	66.5
Diarrhea and enteritis	16	.9	16.5	8	.9	17.1	8	.9	16.1
Appendicitis	35	2.0	36.0	16	1.9	34.1	19	2.1	38.3
Other diseases of the digestive system	32	1.8	32.9	15	1.8	32.0	17	1.9	34.2
Non-venereal diseases of the genito-urinary system and annexa	53	3.0	54.5	22	2.6	46.9	31	3.5	62.4
Diseases of the kidneys and annexa	37	2.1	38.0	21	2.5	44.8	16	1.8	32.2
Diseases of the uterus	10	.6	10.3	1	1	10	10	1.1	20.1
Other diseases of the genito-urinary system	6	.3	6.2	1	1	5	5	.6	10.1
The puerperal state	56	3.2	57.6	.....	.....	.....	56	6.2	112.8
Normal childbirth	50	2.9	51.4	.....	.....	.....	50	5.6	100.7
Other puerperal diseases and conditions	6	.3	6.2	.....	.....	.....	6	.7	12.1
Diseases of the skin and annexa	27	1.5	27.8	15	1.8	32.0	12	1.3	24.2
Diseases of the bones and organs of locomotion	36	2.1	37.0	20	2.4	42.6	16	1.8	32.2
Congenital malformations	6	.3	6.2	3	.4	6.4	3	.3	6.0
Old age	40	2.3	41.1	21	2.5	44.8	19	2.1	38.3
External causes	193	11.0	198.4	138	16.2	294.2	55	6.1	110.8
Ill-defined diseases and conditions	109	6.2	112.1	48	5.6	102.3	61	6.8	122.9
Operation, unqualified	6	.3	6.2	3	.4	6.4	3	.3	6.0
Crippled	7	.4	7.2	4	.5	8.5	3	.3	6.0
Other ill-defined diseases and conditions	96	5.5	98.7	41	4.8	87.4	55	6.1	110.8

fact recalls the high prevalence of nervous disorders registered in the Rochester survey. Diseases and conditions of the puerperal state were enumerated in 56 instances at a rate of 57.6 per 100,000. This rate compares well with that for North Carolina, but was exceeded by about one-half by the Rochester rate. Diseases of the kidneys and annexa were registered in 37 cases at a rate of 38.0 per 100,000. The rate for this group of diseases and conditions was the lowest of any of the three recorded in our surveys. "Colds" and diseases of the respiratory system, such as bronchitis and pneumonia were present to a lesser degree in Boston than in the North Carolina survey which was taken in mid-spring. Thus, the sickness rate for "colds" (17.5), was about one-half of that registered for Rochester and about one-third the rate for the North Carolina survey. Pneumonia had a rate slightly in excess of that for Rochester; the Boston rate was very nearly one-fourth the rate for the North Carolina survey. In the low rates for both "colds" and pneumonia we can readily discern the influence of the season of the year.

#### DISEASE BY AGE.

The cases of sickness recorded in the survey have already been considered with respect to their relative frequency at the several broad divisional periods of life. We shall now consider some of the individual diseases in relation to age period. In the group of ages under 15, the acute infectious diseases of children have their greatest frequency; 95 out of the total of 100 cases of such diseases occurred at this time of life. "Colds" and bronchitis were also prominently represented in the ages under 15; 21 such cases out of a total of 41 were thus registered. Tonsillitis and other diseases of the pharynx occurred most frequently at these ages, in 19 cases out of a total of 24 at all ages. Ten of the sixteen cases of diarrhea and enteritis also occurred at this period.

During the period of life between the ages 15 and 34 years, tuberculosis of the lungs was prominently identified; 38 cases out of a total of 90 occurred in this age period. Appendicitis was also observed to be fairly well concentrated in this period of life, in 23 cases out of a total of 35. Diseases and conditions of the puerperal state have their special incidence in this age period; 47 out of a total of 59 such cases were found. A little

more than one-quarter of the total cases of sickness and disability from external causes were registered between the ages 15 and 34.

The third period of life under observation, ages 35 to 54, was characterized by a larger representation of the chronic diseases than either of the two divisional periods previously considered; tuberculosis of the lungs showed 40 out of a total of 90 cases, all forms of rheumatism 72 out of 201 cases, mental alienation 21 cases out of a total of 34. Eighty-one instances of sickness due to external causes were registered in this third age period.

In the final age period, including all the ages 55 and over, rheumatism, as was to be expected, showed its highest proportionate frequency, namely, 93 out of a total of 201 cases. Cerebral hemorrhage, apoplexy and paralysis showed 57 cases in this age period out of a total of 83 at all ages. Organic diseases of the heart and diseases of the kidneys and annexa were also prominently represented in this last age period.

Certain diseases registered in this survey, such as neuralgia and neuritis, pneumonia, diseases of the skin and diseases of the bones were fairly well distributed over the entire range of life.

Table 4 shows these facts in greater detail. (See pages 12-13.)

#### DURATION OF SICKNESS.

Table 5 on page 14 gives a display of the total sicknesses distributed by the duration periods specified in the enumeration.

In a total of 1,902 cases of sickness reported, the duration of the illness up to the date of inquiry was specified in 1,853 instances. More than one-quarter of the known cases (26.3%) reported durations of illness less than one month; 39.1% were reported sick for a period less than three months, and 48.4% or very nearly half of the total cases showed a sickness period of less than six months. These percentages approximate very closely the ones reported for the Rochester material, but are considerably different from those for the North Carolina survey. In the latter inquiry a large number of acute diseases and conditions were discovered, and this very decidedly increased the proportion of cases sick for short periods of time.

TABLE 4.

*Number of Cases of Specified Diseases and Conditions. Total Sick Persons. Classified by Age.*

DISEASE OR CONDITION	AGE PERIOD					Age unknown
	All ages	Under 15	15 to 34	35 to 54	55 and over	
All diseases and conditions.....	1,902	358	463	588	487	6
General diseases.....	504	138	94	148	124	...
Typhoid fever.....	2	2	1	1	...	...
Measles.....	44	43	7	1	...	...
Scarlet fever.....	9	7	1	1	...	...
Whooping-cough.....	39	39	6	1	...	...
Diphtheria and croup.....	8	6	1	1	...	...
Influenza.....	1	...	...	...	1	...
Tuberculosis of the lungs.....	90	6	38	40	6	...
Other forms of tuberculosis.....	19	9	4	4	2	...
Cancer (all forms).....	19	...	2	7	10	...
Other tumors.....	12	...	4	4	4	...
Rheumatism.....	201	8	28	72	93	...
Other general diseases.....	60	18	15	19	8	...
Diseases of the nervous system and of the organs of special sense.....	377	44	98	117	118	...
Cerebral hemorrhage, apoplexy and paralysis.....	83	4	3	19	57	...
Mental alienation (insanity).....	34	...	7	21	6	...
Neuralgia and neuritis.....	21	2	4	9	6	...
“Run-down”.....	22	...	15	6	1	...
“Nervousness”.....	108	9	39	37	23	...
Feeble-minded.....	14	4	6	2	2	...
Other diseases of the nervous system.....	54	14	21	11	8	...
Diseases of the eyes and ears.....	23	10	1	6	6	...
Blind.....	16	1	2	5	9	...
Deaf and dumb.....	2	...	...	1	...	...
Diseases of the circulatory system.....	137	22	21	40	54	...
Organic diseases of the heart.....	99	18	17	27	37	...

Diseases of the respiratory system.....	17	10	4	2	... 7	1
“Colds”.....	24	11	2	4	3	...
Bronchitis.....	27	8	8	8	11	...
Pneumonia (all forms).....	57	8	13	25	11	...
Other diseases of the respiratory system.....	197	50	60	64	22	1
Diseases of the digestive system.....	9	8	1	...	1	...
Tonsillitis.....	15	11	3	...	4	...
Other diseases of the pharynx.....	13	1	3	5	12	...
Indigestion.....	73	10	19	32	2	...
Other diseases of the stomach.....	16	10	2	2	3	...
Diarrhea and enteritis.....	35	1	23	11	3	1
Appendicitis.....	36	9	9	14	3	...
Other diseases of the digestive system.....	65	3	10	28	23	1
Diseases of the genito-urinary system.....	45	2	5	16	22	...
Diseases of the kidneys and annexa.....	14	1	5	9	1	...
Diseases of the uterus.....	6	...	...	3	...	...
Other diseases of the genito-urinary system.....	59	...	47	12	...	...
13 The puerperal state.....	3	...	2	1	...	...
Pregnancy.....	50	...	40	10	...	...
Normal childbirth.....	6	...	5	1	...	...
Other puerperal diseases and conditions.....	32	5	9	12	6	...
Diseases of the skin and annexa.....	41	3	13	13	12	...
Diseases of the bones.....	6	4	2	...	...	...
Congenital malformations.....	40	...	...	...	40	...
Old age.....	201	30	55	81	32	3
External causes.....	118	22	27	34	35	...
Ill-defined diseases and conditions.....	6	1	3	2	3	...
Operation, unqualified.....	7	1	2	32	2	...
Crippled.....	105	21	22	30	...	...
Other ill-defined diseases and conditions.....						

TABLE 5.

*Number of Cases of Sickness at Each Duration Period in Boston, Mass.*

DURATION OF SICKNESS	No. of cases in specified duration period	Percentage of total known durations
All durations . . . . .	1,902	100.0
One day . . . . .	34	1.8
1 day to 1 week . . . . .	136	7.3
1 week to 2 weeks . . . . .	145	7.8
2 weeks to 3 weeks . . . . .	86	4.8
3 weeks to 1 month . . . . .	82	4.6
1 month to 2 months . . . . .	150	8.1
2 months to 3 months . . . . .	88	4.7
3 months to 6 months . . . . .	172	9.3
6 months to 1 year . . . . .	168	9.1
1 year to 3 years . . . . .	315	17.0
3 years and over . . . . .	477	25.7
Unspecified . . . . .	49	....

Among the 1,747 persons sick and unable to work the duration of illness was specified in 1,706 cases. About one-half of these with specified durations of sickness (47.9%) had been sick less than six months prior to the day of the inquiry. The corresponding figure for Rochester was 40.7% and for North Carolina 67.0%. When distributed over the eleven specified duration periods the Boston cases were found to approximate closely those for Rochester. As pointed out before, the large number of cases of acute diseases in North Carolina seriously disturbed the general distribution of total persons sick and unable to work. As was to be expected, the chronic diseases, such as tuberculosis of the lungs, cancer and diseases of the heart, have their greatest incidence in the periods of long duration.

Table 6, opposite, presents some of the important diseases and conditions among the sick unable to work, classified by duration of illness and by sex.

The number of persons sick but able to work was 155, and among these the duration of illness was specified in 147 instances. As in our previous surveys, we found that the greater proportion of these cases were chronic diseases with durations longer than six months. The small number of such cases registered did not permit of any extensive tabulation according to disease or condition.

TABLE 6.

Number of Persons by Specified Durations of Sickness to Date of Inquiry, by Disease or Condition and by Sex. Persons Sick and Unable to Work.

SEX OR CONDITION; SEX	All durations	1 day	Over 1 day and under 1 week	1 week and under 2 weeks	2 weeks and under 3 weeks	3 weeks and under 1 mo.	1 mo. and under 2 mos.	2 mos. and under 3 mos.	3 mos. and under 6 mos.	6 mos. and under 1 year	1 year and under 3 years	3 years and over	Not specified
Diseases and conditions	1,747	33	135	141	82	81	146	79	154	153	281	421	41
ales.....	850	14	64	58	38	39	82	40	80	78	132	209	16
males.....	897	19	71	83	44	42	64	39	74	75	149	212	25
Sickles:													
ales.....	23	4	8	9	1	1	...	...	...	...	...	...	...
males.....	21	2	10	8	1	...	...	...	...	...	...	...	...
Croup-cough:													
ales.....	15	...	2	3	...	2	7	1	...	...	...	...	1
males.....	24	...	2	1	5	6	8	1	...	...	...	...	...
Tuberculosis of the lungs:													
ales.....	55	...	...	...	1	...	...	2	...	13	12	16	...
males.....	27	...	...	...	...	...	...	...	1	4	5	9	7
Rheumatism:													
ales.....	70	...	3	1	4	2	7	...	9	3	20	21	...
males.....	105	2	1	4	1	3	5	6	9	5	29	40	...
Cerebral hemorrhage,													
Polyneuritis and paralysis:													
ales.....	31	...	...	...	1	...	1	...	1	2	2	9	16
males.....	50	...	1	1	...	2	...	2	4	4	10	26	...
Nervousness, "run-down":													
ales.....	35	...	...	3	2	...	1	4	5	2	7	11	...
males.....	86	...	...	7	4	4	8	10	17	10	13	12	1
Cardio-vascular diseases of the heart:													
ales.....	42	...	...	...	...	1	5	2	3	7	11	13	...
males.....	49	...	...	...	1	1	1	3	1	5	15	16	...
Uremia (all forms):													
ales.....	18	...	1	1	4	2	2	4	3	1	...	...	1
males.....	8	...	1	3	...	...	2	...	1	...	...	...	...
Inflammation and other diseases of the stomach:													
ales.....	31	4	1	4	2	2	2	2	2	2	5	5	3
males.....	41	1	7	3	1	3	5	...	5	1	7	5	3
Diseases of the kidneys and annexa:													
ales.....	21	...	...	...	1	1	...	2	1	4	2	6	...
males.....	16	...	...	...	1	1	...	1	2	3	2	6	...
Normal childbirth:													
males.....	50	2	13	24	8	1	2	...	...	...	...	...	...
Other puerperal diseases and conditions:													
males.....	6	...	...	1	1	...	...	1	2	...	...	1	...
External causes:													
ales.....	138	3	15	11	8	14	20	11	13	18	10	10	5
males.....	55	3	8	6	1	5	9	1	7	8	2	4	1
Other diseases and conditions:													
ales.....	371	3	34	26	17	14	34	14	26	29	48	115	11
males.....	359	9	28	23	20	17	24	13	16	34	62	95	18

## MEDICAL ATTENDANCE.

Of the 1,902 cases of sickness, 1,386, or 72.9%, had medical attendance. The proportion is considerably higher than that found for Rochester (61.0%), or that for North Carolina (61.5%). This is in part explained by the character of the illnesses recorded and by the exceptional facilities in and about Boston for securing medical attendance. According to the latest available data, there were in Greater Boston 275.4 medical practitioners per 1,000 of population. This figure may be compared with 171.4 per 1,000 for Rochester, New York and 83.3 per 1,000 for the entire State of North Carolina. In addition, we must keep in mind the many hospitals, dispensaries, nursing associations and other agencies, public and private, that serve the sick in Boston. The group of persons sick and unable to work had physicians in attendance in 74.7% of the cases. For the small group of persons sick but able to work, only 52.3% had physician in attendance.

The proportion of cases with medical attendance varied, of course, with the several diseases and conditions. Thus, all the cancer cases sick and unable to work were under observation of a physician as were also all of the pneumonia cases. Tuberculosis of the lungs showed a very high proportion of the cases under the care of a physician (91.5%). About two-thirds of the cerebral hemorrhage, apoplexy and paralysis cases, one-half of the rheumatism cases, and about three-quarters of the cases of stomach and kidney disease had physicians in attendance. Table 7, on page 17, will indicate the proportion of cases with physician in attendance in the principal diseases.

It is a matter of importance to know the kind of medical attendance in cases of sickness, that is, whether the care is by private physician, hospital or dispensary. Table 8, on page 18, shows these facts for all diseases and conditions combined, classified by extent of disability.

Very nearly two-thirds of the total cases of sickness under medical care were treated by private physicians; less than one-quarter were under treatment in hospitals, and the remainder of those under any kind of medical observation were treated by dispensary physicians. These facts on kind of medical attendance are interesting in relation to the several diseases and conditions found among the sick and unable to work. Thus, out of a total of

TABLE 7.

*Number of Cases Attended by Physician or Treated in Institution  
by Sex and by Extent of Disability.*

EXTENT OF DISABILITY AND SEX	Total cases	Physician in attendance	Per cent. Phys. in attendance
<b>ABLE AND UNABLE TO WORK</b>			
All diseases and conditions:.....	1,902	1,386	72.9
Males.....	935	685	73.3
Females.....	967	701	72.5
<b>UNABLE TO WORK</b>			
All diseases and conditions:.....	1,747	1,305	74.7
Males.....	850	641	75.4
Females.....	897	664	74.0
Tuberculosis of the lungs:.....			
Males.....	55	49	89.1
Females.....	27	26	96.3
Cancer:.....			
Males.....	4	3	75.0
Females.....	14	14	100.0
Rheumatism:.....			
Males.....	70	40	57.1
Females.....	105	51	48.6
Cerebral hemorrhage, apoplexy & paralysis:.....			
Males.....	31	20	64.5
Females.....	50	30	60.0
Organic diseases of the heart:.....			
Males.....	42	31	73.8
Females.....	49	41	83.7
Pneumonia (all forms):.....			
Males.....	18	18	100.0
Females.....	8	8	100.0
Diseases of the stomach:.....			
Males.....	31	22	71.0
Females.....	41	34	82.9
Diseases of the kidneys and annexa:.....			
Males.....	21	16	76.2
Females.....	16	13	81.3
All other diseases and conditions:.....			
Males.....	575	440	76.5
Females.....	579	439	75.8
<b>ABLE TO WORK</b>			
All diseases and conditions:.....	155	81	52.3
Males.....	85	44	51.8
Females.....	70	37	52.9
Tuberculosis of the lungs:.....			
Males.....	8	4	50.0
Females.....			
Rheumatism:.....			
Males.....	12	4	33.3
Females.....	14	3	21.4
Diseases of the nervous system:.....			
Males.....	11	7	63.6
Females.....	14	9	64.3
Organic diseases of the heart:.....			
Males.....	3	3	100.0
Females.....	5	4	80.0
Diseases of kidneys and annexa:.....			
Males.....	5	3	60.0
Females.....	3	3	100.0
All other diseases and conditions:.....			
Males.....	46	23	50.0
Females.....	34	18	52.9

TABLE 8.

*Number and Percentage of Cases in Care of Specified Medical Services by Extent of Disability.*

CHARACTER OF MEDICAL ATTENDANCE	TOTAL SICK PERSONS		SICK UNABLE TO WORK		SICK ABLE TO WORK	
	No.	Per Cent.	No.	Per Cent.	No.	Per Cent.
Total with physician in attendance.....	1,386	100.0	1,305	100.0	81	100.0
Private physician.....	894	64.5	816	62.5	78	96.3
Hospital.....	336	24.2	336	25.7	..	....
Dispensary.....	156	11.3	153	11.7	3	3.7

44 measles cases, 29 were under the care of a private physician and 15 were registered as having no medical attendance of any kind. All of the scarlet fever cases were under the care of a physician. Five of them were in hospitals and 4 were under the observation of private practitioners. Whooping-cough cases showed 22 as without physician in attendance, 15 under private medical care, 2 in hospital. Seven out of 8 diphtheria cases were in hospital and 1 was under the care of a private physician.

The medical care of tuberculosis cases is apparently well developed in Boston. In all, 90 cases of tuberculosis of the lungs were registered. Of these, 11 had no physician in attendance, of whom four were able to work. Twenty-six of the cases of tuberculosis were under the care of private physicians, 52 were in hospitals or sanatoria, and 1 was receiving medical care at a dispensary. Two cases of cancer out of a total of 19 were without medical attendance; 2 were in hospitals and 4 were receiving dispensary care. Rheumatism, a disease which constituted a very large proportion of the total cases of sickness, was not under medical observation in 103 out of 201 cases. Private physicians were caring for 76, hospitals for 8, and dispensaries for 14 of these rheumatism cases. Cerebral hemorrhage, apoplexy and paralysis were not under the care of a physician in 32 out of 83 cases. Private physicians had 41, hospitals had 9 and dispensaries had 1 of these cases. All of the 34 cases of mental alienation (insanity) were under hospital care. Diseases of the nervous system reported by the enumerators as "run-down" or "nervousness" (130 cases), had no physician in attendance in 22 instances. Private physicians

were caring for 76 cases, hospitals for 22 and dispensaries for 10 of the cases registered. Out of 99 cases of organic diseases of the heart, 20 were without physician in attendance; 62 had private physicians; 10 were in hospitals and 7 were dispensary cases. Pneumonia showed 21 cases with private physician in attendance and 5 in hospital out of a total of 27 cases. Of 35 cases of appendicitis, 10 were found to be under the care of a private physician, 21 in hospital, 2 under dispensary observation, and 2 had no physician in attendance. The 45 cases of diseases of the kidneys and annexa showed that 25 were under the care of a private physician and 9 in hospital. These facts are shown in Table 9, on the opposite page.

To recapitulate, hospitals cared for a total of 336 cases, and among these there were chiefly tuberculosis of the lungs (52 cases), mental alienation (34 cases) and accidents and injuries (40 cases). Other diseases well represented under those treated in hospitals were diseases of the nervous system, other than mental alienation (52 cases), organic diseases of the heart (10 cases), diseases of the stomach (12 cases), diseases of the kidneys and annexa (9 cases) and normal childbirth (10 cases). The entire distribution of the hospital cases by disease and condition gives an impression consistent with other statistics of cases under treatment in general hospitals.

Dispensary service was registered in 156 cases, and presents a quite different aspect as to diseases and conditions. Accidents and injuries were the chief conditions treated in dispensaries (29 cases). Rheumatism (14 cases), "nervous" and "run-down" conditions (10 cases), organic diseases of the heart (7 cases), diseases of the stomach (7 cases), were the diseases and conditions next in importance among those treated in dispensaries. We are concerned here mostly with cases of minor importance in which the patients are still up and about even if incapacitated for work.

In the Boston survey an additional inquiry, not found in the three previous studies, put at our disposal facts with reference to Visiting Nurse Service in attendance upon the sick. Thus, we found 134 cases receiving the attention of a Visiting Nurse. Seven were measles cases out of a total of 29 recorded as having medical attention but receiving neither hospital nor dispensary care. Four were cancer cases out of a total of 11 which received medical attention outside of hos-

TABLE 9.

*Number of Cases of Sickness Under Care of Specified Medical Service. Diseases and Conditions for Total Sick Persons.*

DISEASE OR CONDITION	All cases	CASES WITH PHYSICIAN IN ATTENDANCE				Visiting nurse in attendance
		Total with physician	Private physician	Hospital	Dispensary	
All diseases and conditions—both sexes.....	1,902	1,386	894	336	156	134
Males.....	935	685	403	201	81	33
Females.....	967	701	491	135	75	101
Measles.....	44	29	29	..	..	7
Scarlet fever.....	9	9	4	5	..	1
Whooping-cough.....	39	17	15	2	..	1
Diphtheria and croup.....	8	8	1	7	..	..
Tuberculosis of the lungs.....	90	79	26	52	1	1
Cancer—all forms.....	19	17	11	2	4	4
Rheumatism.....	201	98	76	8	14	15
Cerebral hemorrhage, apoplexy and paralysis.....	83	51	41	9	1	6
Mental alienation (insanity).....	34	34	..	34	..	..
“Run-down” and “nervousness”.....	130	108	76	22	10	6
Organic diseases of the heart.....	99	79	62	10	7	11
Pneumonia—all forms.....	27	26	21	5	..	2
Diseases of the stomach.....	86	65	46	12	7	4
Appendicitis.....	35	33	10	21	2	1
Diseases of the kidneys and annexa.....	45	35	25	9	1	..
Normal childbirth and other puerperal diseases and conditions.....	59	53	42	10	1	20
External causes (accidents and injuries).....	201	174	105	40	29	12
All other diseases and conditions.....	696	471	304	88	79	43

pital or dispensary. Fifteen were rheumatism cases out of a total of 76 having private physician and eleven were cases of organic heart disease out of a total of 62 having private physician in attendance. Twenty out of 42 were cases of the puerperal state under medical attention. Only two out of 21 pneumonia cases had a Visiting Nurse; finally only twelve cases of accidents and injuries out of 105 with private physician were so treated. It is, therefore, questionable whether public health nursing in Boston is generally available for a large number of cases of sickness which it is agreed are well served by this medical auxiliary.

The following table shows the principal diseases and conditions nursed among the policy-holders of the Metropolitan Life Insurance Company during 1915 and serves in this connection as a basis of comparison with the data shown in Table 9 (page 20).

TABLE 10.

*Number and Percentage of Cases Visited in Boston, Mass., During 1915 by Visiting Nurse Service of Metropolitan Life Insurance Company. Principal Diseases and Conditions Nursed and Advised, with Physician in Attendance.*

DISEASE OR CONDITION	Number of cases	Percentage of total
All diseases and conditions.....	3,651	100.0
Typhoid fever.....	17	.5
Measles, scarlet fever, whooping-cough, diphtheria and croup.....	236	6.5
Tuberculosis of lungs.....	37	1.0
Rheumatism, acute and chronic.....	117	3.2
Pneumonia—all forms.....	228	6.2
Diseases of digestive system.....	376	10.3
Tonsillitis.....	139	3.8
Puerperal state.....	726	19.9
External causes.....	292	8.0
All other diseases and conditions.....	1,483	40.6

The proportions of cases of certain diseases receiving Visiting Nurse care in the survey agreed fairly closely with the proportions for these diseases in the entire Visiting Nurse Service of the Company in Boston during 1915. Thus, during this year the Visiting Nurse Service had 6.5% of its cases registered under the four communicable diseases of childhood (measles, scarlet fever, whooping-cough, diphtheria); in the nursed

cases registered by the survey, 6.7% of the cases were classified under this heading. Diseases and conditions of the puerperal state constituted 19.9% of the cases registered in the Visiting Nurse Service and 14.9% of the nursed cases enumerated in the survey. With due consideration for differences in season of the year and other limiting circumstances, we think that there is fairly close agreement between representation of diseases and conditions in the Company's general Nursing Service for 1915, and in the enumerations of the sickness survey of July, 1916.

#### ECONOMIC LOSS FROM SICKNESS IN BOSTON.

In both the Rochester and North Carolina surveys our findings were for many reasons minimal. Likewise, the seasonal conditions in Boston during July were so favorable as to result in a low sickness rate in this investigation. Computations of the amounts of physical disability due to sickness and accident on the basis of our findings may be expected, therefore, to produce conservative figures. The estimated male population of Boston, 15 years and over, in 1916 is 272,219. On the basis of the sickness rate determined by this survey for these ages (21.6 per thousand) we may conclude that there are at least 5,880 males in Boston constantly sick and disabled. At 300 working days per year per individual, there is a loss of 1,764,000 working days or 6.5 working days per individual. This average of time loss for sickness and accident per male in the general community may be compared with 7.6 days for the State of North Carolina and 7.0 days for the city of Rochester. The latest available figure for males of working age in the Local Sick Benefit Societies of Germany, namely, for the year 1913, shows an average of 8.8 days of disability for work per year.

In like manner, the 286,081 females of working age may be expected to give a total of 6,237 persons constantly sick, which at 300 working days per year per individual, gives a total loss of 1,871,100 working days, or an average of 6.5 days per individual per year. The corresponding figure for the Rochester survey was 7.7 days; for North Carolina 10.2 and for the latest German Sickness Society experience, 9.8 days.

#### CONCLUSION.

The following are the principal findings of the present survey:

1. Close to 2% of the population of Boston was found to be sick. This proportion is smaller than that registered in previous surveys.

2. Slightly more than 90% of the total cases of sickness involved disability for work.

3. The principal diseases responsible for the sickness registered were rheumatism, organic diseases of the heart, tuberculosis of the lungs, diseases of the kidneys and diseases and conditions of the puerperal state.

4. The proportion of cases sick less than one month up to the date of the survey was only 26.3% of the total. This was slightly higher than the finding for Rochester, N. Y., but considerably lower than the proportion of cases sick less than one month in North Carolina. The relatively small number of cases of the acute infectious diseases accounted for this condition.

5. Of the total cases 72.9% received medical attention; this is a higher percentage than that developed in either of the preceding surveys. This finding reflects the excellent medical facilities available in the city of Boston. Hospitals and dispensaries provided a large proportion of the total amount of medical care.

6. The economic loss resulting from sickness in Boston is considerable, involving the loss of earnings for about seven days per person per year.









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